

specification. The disclosure, abstract, and drawings are objected to. Reconsideration and allowance of the claims are requested.

OBJECTIONS TO THE DRAWINGS

The drawings are objected to because they do not show a series of aligned layers aligned upon at least a portion of the substrate. Figure 5 is hereby amended to depict the series of aligned layers as described in the original specification. Reconsideration and withdrawal of the objection are respectfully requested.

SPECIFICATION OBJECTIONS

The disclosure and abstract are objected to because of informalities. The specification is hereby amended as given above to overcome the informalities. Reconsideration and withdrawal of the objection are respectfully requested.

CLAIM REJECTIONS UNDER §101

Claims 18-19 are rejected under 35 U.S.C. 101 as being directed to non statutory subject matter. Claims 18-19 are hereby cancelled.

CLAIM REJECTIONS UNDER §112

Claims 18-19 are rejected under 35 U.S.C. 101 as being indefinite. Claims 18-19 are hereby cancelled.

CLAIM REJECTIONS UNDER §102

Claims 1-3, 5-6, 8, and 18-19 are rejected under 35 U.S.C. 102 as being unpatentable over Glenn et al. Independent claim 1 claims, *inter alia*, an integrated circuit substrate having a first surface for receiving a series of aligned layers during the creation of the integrated circuit, and a second surface disposed substantially opposite the first surface, the second surface having *at least one alignment mark for aligning the series of aligned layers one to another* during the creation of the integrated circuit. Thus, it is explicitly stated that the alignment marks on the second surface of the substrate are used to align the layers one to another. *Therefore, the alignment marks are present in the substrate prior to the formation of the aligned layers of the integrated circuit.* Not only is this explicitly claimed, but it is also an

inherent aspect of the invention as described throughout the specification and as depicted in the figures.

Glenn et al. do not describe such a substrate. Glenn et al. describe a substrate that already has all of the aligned layers formed on it, because front side processing of the integrated circuit is completed, and the substrate is being diced into individual integrated circuits. Thus, the substrate of Glenn et al. does not have at least one alignment mark for aligning the series of aligned layers one to another, as claimed in claim 1. Glenn et al. describe a substrate that has no markings on the back side during the formation of the layers, and then receives a mark just prior to dicing, after the aligned layers have been formed and scribe lines have been defined on the front side of the substrate. Glenn et al. repeatedly describe forming the back side marks with reference to the features already formed on the front of the substrate. Therefore, Glenn et al. do not describe a substrate having markings that are used to align the layers of an integrated circuit during processing, as claimed in claim 1.

Thus, claim 1 patentably defines over Glenn et al. Reconsideration and allowance of claim 1 are respectfully requested. Dependent claims 2-3, 5-6, and 8 depend from independent claim 1, and contain additional important aspects of the invention. Therefore, dependent claims 2-3, 5-6, and 8 patentably define over Glenn et al. Reconsideration and allowance of dependent claims 2-3, 5-6, and 8 are respectfully requested. Claims 18-19 are hereby cancelled.

CLAIM REJECTIONS UNDER §103

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. in view of Fujimura. Dependent claim 4 depends from independent claim 1, and claims, *inter alia*, an integrated circuit substrate having a first surface for receiving a series of aligned layers during the creation of the integrated circuit, and a second surface disposed substantially opposite the first surface, the second surface having at least one alignment mark for aligning the series of aligned layers one to another during the creation of the integrated circuit, wherein the at least one alignment is printed on the second surface.

The deficiencies of Glenn et al. in regard to the limitations of independent claim 1 are described at length above. Fujimura does not compensate for the deficiencies of Glenn et al., in that Fujimura does not describe printing an alignment

mark on the back side of the substrate, for use in aligning layers on the front side of the substrate. Therefore, the combination of Glenn et al. and Fujimura does not described the substrate as claimed in claimed 4.

Thus, claim 4 patentably defines over Glenn et al in view of Fujimura. Reconsideration and allowance of claim 4 are respectfully requested.

CONCLUSION

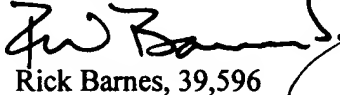
Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. A marked copy of the amendments is provided herewith. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now in fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. Should the examiner require further clarification of the invention, it is requested that he contact the undersigned before issuing the next office action.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By:


Rick Barnes, 39,596

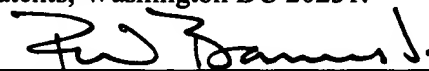
2002.09.03

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I hereby certify that this correspondence is being deposited on the date below with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington DC 20231.

2002.09.03

Date



Rick Barnes, 39,596

MARKED COPY OF AMENDMENTS

IN THE SPECIFICATION

Please replace the third full paragraph on page 8 with the following text:

The substrate 10 is oriented on the substrate support 24 with the second surface 14 of the substrate 10 adjacent the substrate support 24. Thus, the alignment marks 16 on the second surface 14 of the substrate 10 are adjacent the substrate support 24. Most preferably, the substrate 10 is rough aligned before it is positioned on the substrate support 24. This is preferably accomplished by rotating the substrate 10 on a component such as a chuck, while sensing the location of one or both of the major flat 18 and the minor flat 19. By determining the location of one or both of these flats 18 and 19, the substrate 10 can be placed on the substrate support 24 in a relatively known orientation. The benefits of placing the substrate 10 on the substrate support 24 in a known orientation are explained in more detail below.

Please replace the first full paragraph on page 10 with the following text:

Thus, by placing the complimentary alignment marks 40 in a known position relative to the image or images on the mask 38, and placing the alignment marks 16 in a known position relative to the substrate 10, and then aligning the complimentary alignment marks 40 to the alignment marks 16, the various patterned layers 11 of the integrated circuit formed on the first surface 12 of the substrate 10 are all aligned one to another. The preferred methods and means for aligning the complimentary alignment marks 40 and the alignment marks 16 one to another are described in more detail below.

Please replace the abstract with the following text:

An integrated circuit substrate having a first surface for receiving a series of aligned layers during the creation of the integrated circuit, and a second surface disposed substantially opposite the first surface, where the second surface has at least one alignment mark for aligning the series of aligned layers one to another during the creation of the integrated circuit. ~~In another aspect the invention provides for a~~An

apparatus for aligning a mask having an image and at least one complimentary alignment mark to a substrate having a first surface and a substantially opposing second surface. ~~T, where the substrate further has at least one alignment mark on the second surface. A mask support supports the mask in proximity to the first surface of the substrate. A substrate support supports the substrate with the first surface in proximity to the mask. An alignment means aligns the at least one alignment mark on the second surface of the substrate to the at least one complimentary alignment mark on the mask. An exposure source projects the image of the mask onto the first surface of the substrate, and a controller controls the mask support, substrate support, alignment means, and exposure source. In yet another aspect, the invention provides for a method for aligning a mask having an image and at least one complimentary alignment mark to a substrate having a first surface and a substantially opposing second surface. The substrate also has at least one alignment mark on the second surface. A mask is disposed in proximity to the first surface of the substrate. An image of the at least one alignment mark is created, as is an image of the at least one complimentary alignment mark. At least one of the mask and substrate is moved relative to the other, and the image of the least one alignment mark is aligned to the image of the at least one complimentary alignment mark. The image of the mask is projected onto the first surface of the substrate.~~

IN THE FIGURES

Please enter the amendments to Fig. 5 as depicted in the marked copy of the drawing provided herewith.